

AIRCRAFT CIRCULARS  
NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS

---

No. 45

---

THE BLACKBURN "BLUEBIRD"  
Two-Seat Training and Sport Airplane

---

Washington  
June, 1927

FILE COPY  
To be returned to  
the files of the National  
Advisory Committee  
for Aeronautics  
Washington, D. C.

NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS.

AIRCRAFT CIRCULAR NO. 45.

THE BLACKBURN "BLUEBIRD."

Two-Seat Training and Sport Airplane.

The "Bluebird" is a two-seat side-by-side biplane, and was designed for preliminary training and pleasure flying.

The side-by-side seating arrangement was chosen for several reasons. For instruction work the placing of pilot and pupil side-by-side makes instruction easier, by letting the instructor see what the pupil is doing, and vice-versa. At the same time it allows the crew to talk, so that the instructor can make sure that his instructions are properly understood and the pupil can answer his instructor and ask his advice at all times.

For pleasure flying the side-by-side seating makes for sociability and overcomes the comparative loneliness that is common in the more frequently used tandem seating, particularly on cross-country flying.

From an aerodynamical point of view, side-by-side seating means that the heaviest loads are concentrated about center of gravity of the airplane, with the result that a more stable and controllable aircraft can be produced.

Full control at low speeds is obtained as no offset loads can come into action at periods when the control surfaces are

---

\*From "The Aeroplane," March 16, 1927.

only receiving a minimum of air flow. The position of the crew on the axis of rotation also adds to their flying comfort in all evolutions, and particularly aerobatics.

Finally, centralization of weight also means centralization of structure strength, so that when once a strong center structure construction has been obtained the remainder can be safely constructed at a minimum of weight.

### Construction

The fuselage is built in two sections, which are complete in themselves and are detachable from each other for repair or replacement.

The front part, comprising the main center structure and including the cockpit, is built up of steel tube longerons, wooden bulkheads and is covered with a three-ply skin. There are three bulkheads: the first is the fireproof bulkhead, and the second and third are the main cockpit members. This portion supports the top wing center section, the bottom wing roots, and the landing gear.

The rear part of the fuselage is of the normal four-longeron structure, faired both above and below, and is fabric-covered.

The engine mounting consists of a triangulated steel tube structure in the form of two "W's" in plan view. These are braced by a diagonal tube at each side, and the four points

which form the bases of the two "W's" are bolted to a rectangular steel plate fitting which is in turn bolted to the fireproof bulkhead.

The cockpit is situated under the center section. The seats are comfortably upholstered and to those who may be familiar with the original "Bluebird" it may be interesting to point out that in the 1927 model, in order to improve the view from the cockpit, the top wing has been raised 6 inches, the trailing edge of the center section has been cut away and the fuselage fairing has been curved more sharply in front of the cockpit.

The central fore-and-aft bridge dividing the cockpit in the old model has been removed, one through seat to accommodate both occupants has been fitted, and the interior has been lengthened to give more leg room.

Side doors on both sides allow easy entrance and exit, and ample wind-screens provide adequate protection without hindering the view. Each lower wing root has been reinforced for the purpose of stepping into the cockpit and the height of this is convenient from the ground. The main gasoline tank with a capacity of 16 gallons is mounted in the center section, giving an ample head for gravity feed to the engine. The oil tank is situated in front of the fireproof bulkhead and oil is in constant circulation through the tank through a pipe circuit to and from the engine oil pump.

The wings are of normal single bay biplane construction. The top wing is staggered slightly forward, and both wings are swept back  $5^{\circ}$  from the center wing.

The wing section is No. 64. The wings are built up of normal spruce bars and built-up ribs with internal bracing of duralumin tubular drag struts and steel tie-rods. All external bracing consists of streamline wires.

The top center section is braced laterally by streamline wires and is stabilized fore-and-aft by steel stay-tubes running aft from the back center section strut fittings to the back bulkhead of the front section of the fuselage. This is to enable a clean entrance through the doors on each side of the cockpit.

The wings are made to fold about the rear spar wing-root joints, the folded width of the airplane being 9 ft. 8 in.

The tail unit is of the normal type consisting of fin, rudder, stabilizer, and divided elevators. The tail and elevator construction is of the wood spar and rib type, braced internally by wood drag struts and steel tie-rods. The fin and rudder are built up of spruce ribs and duralumin framework. The whole unit is fabric-covered.

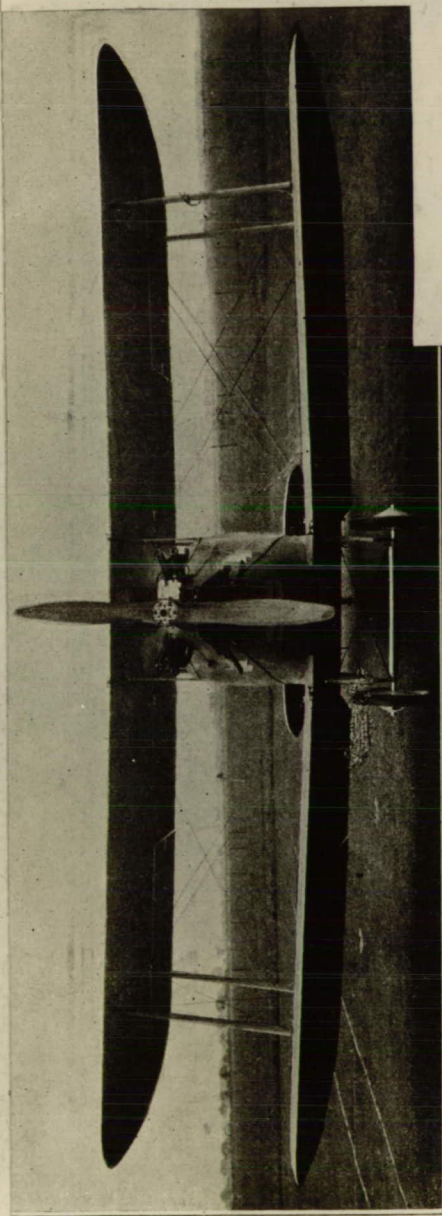
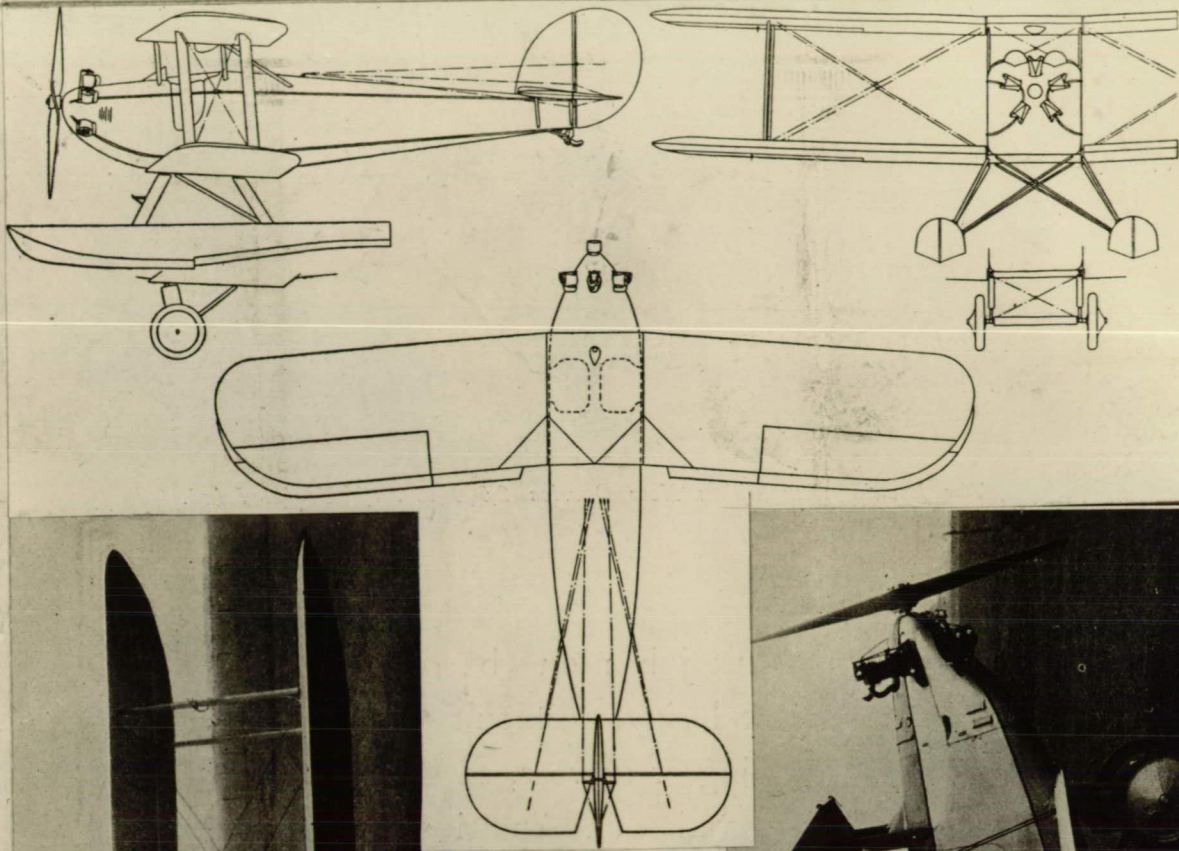
The landing gear consists of two Vees, the front legs of which are telescopic and are sprung by rubber discs.

The "Bluebird" can also be supplied as a seaplane. The floats are of duralumin construction, according to the most up-

## Characteristics (Cont.)

Wing loading (land)	5.9 lb./sq.ft.
Power loading (land)	17.9 lb./HP.
Wing loading (seaplane)	6.14 lb./sq.ft.
Power loading (seaplane)	19.5 lb./HP.
Maximum speed (land)	88 M.P.H.
Maximum speed (seaplane)	84 "
Landing speed (land)	35 "
Landing speed (seaplane)	40 "
Cruising speed (land)	70 "
Maximum speed at 5000 ft. (seaplane)	82 "
Climb from sea level (seaplane)	480 ft./min.
Service ceiling (seaplane)	10000 ft.





—The front view of the Bluebird (Genet engine).—

Span .....	28 ft. 0 in.
Span (folded) .....	9 ft. 8 in.
Chord .....	4 ft. 9 in.
Length .....	22 ft. 6 in.
Height .....	8 ft. 4 in.
Wing area .....	237½ sq. ft.



—Side view of the Blackburn Bluebird (Genet engine).—